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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/349,575 07/08/99 GAUTHIER

R 41705.P0001

MMC2/0214

EXAMINER

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ART UNIT

PAPER NUMBER

2837

DATE MAILED:

02/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks



<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/349,575	GAUTHIER ET AL.	
Examiner	Art Unit		
Edgardo San Martin	2837		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 08 July 1999.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-22 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved.

12)  The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

13)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

15)  Notice of References Cited (PTO-892) 18)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_  
16)  Notice of Draftsperson's Patent Drawing Review (PTO-948) 19)  Notice of Informal Patent Application (PTO-152)  
17)  Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 20)  Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 6 - 13, 16 – 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Plunkett (US 4,928,043).

With respect to Claims 1, 13 and 20, Plunkett teaches a method, comprising the steps of driving a polyphase motor with a drive voltage, and sampling a back emf of a selected phase of the motor to determine positional error of a motor rotor only while a drive voltage of the selected phase is substantially zero (Col.2, Line 43 – Col.3, Line 13, and Col.4, Lines 17 - 52).

With respect to Claims 6 and 7, Plunkett teaches the motor being a three phase brushless DC motor (Fig.1, Item 10; Col.4, Line 17+).

With respect to Claims 8 and 9, Plunkett teaches wherein the drive voltage of the selected phase passes through zero during sampling and wherein the selected drive voltage does not pass through zero during sampling (Figs.5 and 6; Col.5, Lines 6 - 56).

With respect to Claims 10 and 11, Plunkett teaches comprising the step of controlling commutation of the motor in accordance with the sampled back emf, and the step of varying a frequency of the drive voltage in accordance with the sampled back emf (Col.6, Lines 5 – 26).

With respect to Claims 12, 17 and 18, Plunkett teaches comprising the step of generating a speed control signal corresponding to a difference between a desired rotor angular velocity and a rotor speed inferred from a frequency of the drive voltage or the back emf, and varying an amplitude of the drive voltage in accordance with the speed control signal (Col.4, Line 33 – Col.5, Line 44).

With respect to Claim 16, Plunkett teaches the sampled back emf being normalized with respect to a commanded angular velocity of a motor rotor (Col.2, Line 53 – Col.3, Line 13).

With respect to Claim 19, Plunkett teaches an inverter (Fig.1, Item 12), a waveform generator (Fig.1, Items 14 and 24) providing a drive waveform to the inverter,

wherein a frequency of the drive waveform varies in accordance with the commutation control signal, wherein the inverter provides the drive voltage at a same frequency as the drive waveform (Col.4, Lines 17 – 45).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 3, 14, 15, 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett (US 4,928,043).

Plunkett teaches the limitations discussed in the previous rejection, but fails to disclose the drive voltage being substantially sinusoidal or trapezoidal.

The Examiner takes Official notice that the use of sinusoidal and trapezoidal voltage is well known in the art.

It would have been obvious to a person with ordinary skill in the art to use a sinusoidal or trapezoidal voltage because in addition to be well known in the art, the

type of voltage to be use depend upon how simple the designer wants to keep the control system.

3. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett (US 4,928,043) in view of Jarwick (US 4,173,796).

Plunkett teaches the limitations discussed in the previous rejections, but fail to disclose the motor being a component of an implantable medical device.

On the other hand, Jarwick teaches an implantable heart assist pump comprising a motor (Abstract and Col.4, Line 57 – Col.5, Line 26).

It would have been obvious to a person with ordinary skill in the art to employ the Plunkett motor control system with the Jarwick motor because the control system would improve the efficiency and performance of the motor, improving the quality of the implantable heart assist pump.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lancisi et al. (US 6,149,683) teach a power system for an implantable heart pump, Lee (US 5,789,895) teaches a BEMF crossing detection in PWM mode operation for sensorless motor control application, Erdman et al. (US

5,646,491) teach an electrical motor with a differential phase back emf sensing circuit for sensing rotor position, Moreira (US 5,481,166) teaches a motor control for brushless permanent magnet using only three wires, Peters et al. (US 5,382,889) teach a self-commuting, back emf sensing, brushless DC motor controller, Cooper et al. (US 4,585,983) teach an electric power inverter with adaptive third harmonic auxiliary impulse commutation, and Carobolante et al. (EP 602 977) teach a method and apparatus for operating polyphase DC motors using a PWM chopping signal in zero crossing determination.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo San Martin whose telephone number is (703)308-1050. The examiner can normally be reached on 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on (703)308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Edgardo San Martín  
Patent Examiner  
Art Unit 2837  
Class 318  
February 7, 2001



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